

REMARKS

Applicants submit this Amendment in reply to the Office Action dated March 11, 2004. As an initial matter, Applicants gratefully acknowledge the Examiner's indication of the allowance of claim 4.

In this Amendment, Applicants have cancelled claims 2, 15, 19, and 20, without prejudice or disclaimer, amended claims 1 and 3, and added new claim 21 to further define the claimed invention. Claims 1 and 4 are independent claims.

Before entry of this Amendment, claims 1-20 were pending in this application, with claims 5-14 and 16 having been withdrawn from consideration. After entry of this Amendment, claims 1, 3-14, 16-18, and 21 are pending in this application, with claims 5-14 and 16 still having been withdrawn from consideration.

The originally-filed specification, claims, abstract, and drawings fully support the subject matter of amended claims 1 and 3 and new claim 21. No new matter was introduced.

In the Office Action, the Examiner rejected claims 1-3, 15, and 17-20 under 35 U.S.C. §102(e) as being anticipated by Matsumoto (U.S. Patent No. 6,358,361) ("Matsumoto"). For anticipation under 35 U.S.C. §102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. M.P.E.P. 706.02. Claims 2, 15, 19, and 20 have been cancelled, without prejudice or disclaimer, rendering the rejection of those claims moot. With regards to the remaining claims, because Matsumoto does not teach every aspect of claims 1, 3, 17, and 18 either alone or in combination with the other aspects of the claimed invention, Matsumoto does not anticipate any of those claims.

Matsumoto does not disclose or suggest the invention claimed in independent claim 1. For example, independent claim 1 recites a plasma processing apparatus including, among other aspects, "a directional coupler configured to connect the propagation waveguide with the annular waveguide to thereby form the high-frequency traveling wave circulating in the annular waveguide in one direction." Matsumoto does not disclose at least this aspect of the claimed invention either alone or in combination with the other aspects of the claimed invention.

Matsumoto discloses a plasma processing apparatus with a ring member 10 attached to the upper end of a reactor 1. The ring member 10 supports the annular seal plate 4, and has attached on its upper surface a cylindrical block member 25. An annular waveguide antenna member 12 is formed within the cylindrical block member 25. A waveguide 31 is connected to a microwave generator 30 on one end and a guide portion 13 on the other end which leads to antenna member 12. (Figs. 3-4; col. 7, line 25 through col. 8, line 12).

The microwave introduced into the annular waveguide antenna portion 12 then propagates within the dielectric 14 inside the annular waveguide antenna portion 12 as progressive waves traveling in the annular waveguide antenna portion 12 in opposite directions to each other. Both progressive waves meet each other at a point within the annular waveguide antenna portion 12 diametrically opposite to the guide portion 13, forming a standing wave."

(Col. 8, lines 2-12; emphasis added). Accordingly, Matsumoto does not disclose or suggest any plasma processing apparatus having, *inter alia*, "a directional coupler configured to connect the propagation waveguide with the annular waveguide to thereby form the high-frequency traveling wave circulating in the annular waveguide in one direction." as set forth in independent claim 1. Indeed, the structure described in

Matsumoto has the same problem the claimed invention is trying to solve, namely that because the wave is divided when it is propagated into the antenna portion, only standing waves which flow in **both directions** within the antenna member (as opposed to the traveling waves circulating in **one direction** as in independent claim 1) are formed. Such standing waves flowing in **both directions** within the antenna member cause undesirable variability in the electromagnetic field within the processing container, and thus prevents the uniform deposition of plasma on the wafer. (Page 2, lines 17-28). In contrast, the invention as recited in claim 1 includes traveling waves which flow in only **one direction**, which again are different from standing waves which flow in **both directions**.

Note, since the microwave traveling in the annular antenna 73 is not a standing wave, but a traveling wave rotating in the annular antenna in the form of an endless ring, an electromagnetic field emitted from the slots 754 becomes uniform in the circumferential direction of the annular antenna 73. Accordingly, it is possible to produce a remarkably uniform plasma in the processing container 53, allowing an uniform processing to be applied on even a large-diameter wafer.

(Page 10, lines 17-22). Accordingly, because Matsumoto does not disclose every aspect of the invention either alone or in combination with the other aspects of the claimed invention, Applicants respectfully request the allowance of independent claim 1 and its respective dependent claims.

Applicants further submit that claims 3, 17, and 18 depend from one of independent claims 1 and 4, and are therefore allowable for at least the same reasons that each of those respective independent claims is allowable. In addition, at least some of the dependent claims recite unique combinations that are neither taught nor suggested by the cited art, and therefore at least some also are separately patentable.

Furthermore, upon the allowance of independent claims 1 and/or 4, Applicants respectfully request rejoinder and consideration of the withdrawn claims that depend from independent claims 1 and/or 4, respectively, as set forth in M.P.E.P. 809.02(c).

In view of the foregoing remarks, the claimed invention is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

The Office Action contains characterizations of the claims and the related art with which Applicants do not necessarily agree. Unless expressly noted otherwise, Applicants decline to subscribe to any statement or characterization in the Office Action.


In discussing the specification, claims, abstract, and drawings in this Amendment, it is to be understood that Applicants are in no way intending to limit the scope of the claims to any exemplary embodiments described in the specification or abstract and/or shown in the drawings. Rather, Applicants are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

Please grant any extensions of time required to enter this Amendment and
charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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